

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-10 and 12-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Duprie et al. (EP1201711, hereinafter "Duprie") in view of Funkai et al. (US 2004/0191440, hereinafter "Funkai").

In regards to claims 1-3 and 12, Duprie discloses pipes which are referred to as "PE 80" and "PE 100" [0009]. These are polyethylene resins which when formed into pipes of specific dimensions, survive a long term pressure test at different temperatures for a period of 5,000 hours. According to the applicant a pressure pipe is a pipe having a pressure rating of PE 80 and above (pg. 1 lines 22-23). Thus, the pipes of Duprie are considered pressure pipes. The polyethylene pipe resin has a bimodal molecular weight distribution [0016]. The polyethylene resin comprises 35 to 49 wt% of a first polyethylene fraction of high molecular weight having a density of up to 0.930 g/cm<sup>3</sup> and from 51 to 65 wt% of a second polyethylene fraction of low molecular weight having a density of greater than 0.946 g/cm<sup>3</sup> [0013].

In regards to claim 8, Duprie discloses the 35 to 49 wt% of the first polyethylene fraction comprising a linear low density polyethylene having a density of up to 0.930 g/cm<sup>3</sup>, and an HLMI of less than 0.6 g/10 min and 51 to 65 wt% of the second

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polyethylene fraction comprising a high density polyethylene having a density of at least  $0.969 \text{ g/cm}^3$  [0013] with a  $\text{MI}_2$  from 100 to 1000 g/10 min [0026]. The polyethylene resin having a density of greater than  $0.946 \text{ g/cm}^3$  and an HLMI of from 1 to 100 g/10 min [0013].

In regards to claim 9, Duprie discloses forming pipes of the resin material to form “PE 100” pipes [0041].

In regards to claim 10, Duprie discloses the pipes extrapolation shows that they have a  $20^\circ\text{C}/50$  years resistance of at least 8 and 10 MPa, respectively [0009 and 0041]. This classification is described in ISO 9080 and ISO 12162 [0009 and 0041].

Duprie is silent with regards to the use of an ionomer in the polyethylene pipe resin.

Duprie discloses that the polyethylene resins according to the invention can be prepared by any method suitable [0045]. The resins are most often blended with additives [0044].

Funkai discloses that an ionomer polymer is used as an impact-reducing material in piping to improve the impact resistance [0080-0081].

It would be obvious to one of ordinary skill in the art to combine the polyethylene pipe resin of Duprie with the ionomer polymer of Funkai to produce a pipe that has increased impact resistance while maintaining the standards of pressure pipes.

### ***Response to Arguments***

3. Applicant's arguments with respect to claims 1-13 have been considered but are moot in view of the new ground(s) of rejection.

Duprie discloses that the pipes formed from the resin have a good resistance to slow crack growth [0039]. The pipes also have improved long-term creep performance of the polyethylene [0039]. Thus, the examiner feels that the pipes of Duprie with or without the ionomer have the same properties of the pipes disclosed by the applicant. Thus, the Funkai reference is merely to show that an ionomer can be added to the composition to provide increased impact resistance.

4. Claim 11 has been canceled.

5. Claims 12 and 13 have been added.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ELLEN S. WOOD whose telephone number is (571)270-3450. The examiner can normally be reached on Monday-Friday 7-5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carol Chaney can be reached on 571-272-1284. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/Carol Chaney/  
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